

REMARKS

Claims 1 – 5 were pending in the above-identified patent application when last examined. Claims – 5 were rejected in the Office Action dated October 1, 2004. Claims 1, and 3 – 5 are being amended. Claim 6 is being cancelled. Reconsideration is respectfully requested.

Election/Restrictions

In sections 1 and 2 of the Office Action, the Examiner pointed out that claim 6 is drawn to a non-elected invention. Accordingly, Applicants are canceling claim 6.

Objection to Specification

In section 3 of the Office Action, the Examiner objected to the specification because of informalities. The informalities are being corrected by amendment of the specification, as indicated above.

Claim Objections

In section 4 of the Office Action, the Examiner objected to the claims because they include reference numbers which are not enclosed within parentheses. Accordingly, Applicants are amending the claims to remove the reference numbers. Further, the Examiner suggested Applicants amend “zinc-“ to “zinc”. Applicants have done so.

Claim Rejections – 35 U.S.C. §112

In section 5 of the Office Action, the Examiner rejected claims 1 and 3 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Applicants are amending claims 1 and 3 for purposes of clarity.

Claims Rejections – 35 U.S.C. §103

In sections 6 and 7 of the Office Action, the Examiner rejected claims 1 – 5 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,444,267 to Choi et al. (hereinafter

Choi) in view of U.S. Patent No. 6,486,239 to Lee et al. (hereinafter *Lee*). Applicants traverse the rejection.

The present invention relates to a colored steel plate manufactured by electroplating or melt-plating zinc or a zinc alloy on a substrate, treating the zinc or zinc alloy-plated steel plate with a coating-type chromate or non-chromate to prevent the corrosion of the plated steel plate and to improve the adhesion between the plated steel plate and a film, and forming a film having excellent fouling resistance, acid resistance and weather resistance thereon, and a method for manufacturing the colored steel plate.

In contrast, *Choi* relates to a method for manufacturing a gravure-transfer-coated steel plate, which is capable of transferring a pattern from a gravure transfer sheet over a metal plate without any additional adjustment for processing conditions of a general PCM color line, thereby producing a gravure-transfer-coated steel plate having a beautiful appearance and a high workability.

The method for manufacturing the gravure-transfer-coated steel plate of *Choi* comprises the following six steps:

- (1) coating, over the metal plate, a primer coating material;
- (2) forming a primer coating layer;
- (3) thermally pressing a gravure transfer sheet;
- (4) transferring the pattern, as a transfer coating layer;
- (5) coating, over the transfer coating layer, upper coating material; and
- (6) forming an upper coating layer.

The primer coating material comprises flexible polyester resin+ melamine resin + sulfonic acid + isocyanate + Ti based catalyst + pigment + deforming agent + leveling agent + UV filler + hydrocarbon based solvent + ester based solvent, and is coated to a thickness of 10 to 20 μm .

The upper coating material comprises one resin selected from the group consisting of a thermosetting fluorine resin, a thermosetting polyester resin, and an ultraviolet-thermosetting polyurethane-acryl-based resin + solvent+ deforming agent + crosslinking resin + UV filler.

Meanwhile, the high weather resistant colored steel plate by the present invention comprises the following components: Steel plate – plating plate – pretreated layer – primer coating layer – polyester upper coating layer.

The primer coating material uses colored or colored transparent epoxy-modified or polyester-modified primer, and is coated to a thickness of 4 to 7 μm .

The upper coating material comprises main resin obtained by reacting an oil-free

polyester-modified resin and a polyisocyanate compound+ melamine resin + dispersant + rheology control agent + sulphonic acid + pigment + solvent.

As described above, the colored steel plate by the present invention and *Choi* comprise primer coating layer and upper coating layer respectively, however have **very different primer coating material, upper coating material and thickness of primer coating layer.**

That is, in connection with the **primer coating material** used in both inventions, the primer coating material used in *Choi* is **flexible polyester resin+ melamine resin + sulfonic acid + isocyanate + Ti based catalyst + pigment + deforming agent + leveling agent + UV filler + hydrocarbon based solvent + ester based solvent**; that used in the present invention is **colored or colored transparent epoxy-modified or polyester-modified primer.**

Furthermore, in connection with the **thickness of primer coating material** used in both inventions, thickness coated by *Choi* is **10 to 20 μm** ; in the present invention is **4 to 7 μm** .

In the Office Action, the Examiner pointed out that the primer coating layer is a flexible polyester resin and has a dry film thickness of less than $10\mu\text{m}$ (col 2 L 62-65, col 5 L 40-41). However, the description in col 5 lines 40-51 states:

Where the DFT of the primer coating layer 4 is less than $10\mu\text{m}$, the irregularities on the surface of the steel plate may appear on the primer coating layer 4, thereby resulting in occurrence of a popping phenomenon in a subsequent transfer process. Furthermore, the steel plate is insufficiently hidden, so that it is impossible to obtain a consistent color reproducibility. A degradation in workability also occurs. On the other hand, where the DFT of the primer coating layer 4 is more than $20\mu\text{m}$, it may exhibit a degradation in the contactability to the blank. There is also a degradation in terms of the costs. Most preferably, the DFT of the primer coating layer 4 is 14 to $15\mu\text{m}$.

Also, in connection with the **upper coating material** used in both inventions, the upper coating material used in *Choi* is **one resin selected from the group consisting of a thermosetting fluorine resin, a thermosetting polyester resin, and an ultraviolet-thermosetting polyurethane-acryl-based resin + solvent+ deforming agent + crosslinking resin + UV filler**; in the present invention it is **main resin obtained by reacting an oil-free polyester-modified resin and a polyisocyanate compound+ melamine resin + dispersant + rheology control agent + sulphonic acid + pigment + solvent.**

Choi is silent about the polyester upper coating layer containing a polyisocyanate compound. However, as discussed above, **Choi does not disclose components of primer coating material and upper coating material copolymer of the present invention.** Therefore,

it is apparent that the present invention cannot be anticipated from *Choi* by one of ordinary skill in the art.

Lee relates to a polyester based coating composition for anti-stain PCM outside panel having the **excellent combination** of physical properties such as surface compactness, anti-contamination effect, acid resistance and self-cleaning effect, wherein the polyester based coating composition comprises: hydroxyl unsaturated polyester resin, sulfonic acid blocked with secondary amine, sulfonic acid blocked with tertiary amine, isocyanate compound, Tin based curing catalyst, polyalkyl silicate, alkoxy compound; further, the polyester based coating composition for anti-stain PCM outside panel that can demonstrate excellent properties of a film of paint such as **appearance and workability even without the addition of any defoaming agent and leveling agent by adjusting the compatibility of both hydroxyl unsaturated polyester resin and polyalkyl silicate.**

In *Lee*, sulfonic acid blocked with tertiary amine employed as a supplemental curing accelerator, polyalkyl silicate employed as a surface modifier, alkoxy compound employed as a storage stabilizer, and Tin based curing catalyst is used.

Further, the baking temperature used for coating the composition is **250 to 280°C.**

Meanwhile, the high weather resistant colored steel plate of the present invention comprises the following components: Steel plate – plating plate – pretreated layer – primer coating layer – polyester upper coating layer.

The upper coating material **comprises main resin obtained by reacting an oil-free polyester-modified resin and a polyisocyanate compound+ melamine resin + dispersant + rheology control agent + sulphonic acid + pigment + solvent, and is baked with PMT temperature of 190 to 240°C.**

The present invention and *Lee* share the use of **a polyester resin, isocyanate compound and melamin resin curing agent** as upper coating material in common. However, the polyester resin and isocyanate compound used in **the present invention use resin produced by the same reaction.**

By attaching an isocyanate group into a branch of a functional group such as hydroxyl group, carboxyl group etc. connected in backbone of resin, the number of group for main resin may be prescreened and thus endure processability for upper coating obtained by comprising the main resin.

Although the sulfonic acid blocked with tertiary amine, polyalkyl silicate, alkoxy compound, and Tin based curing catalyst, **are essential constituent components of the *Lee*, it is not mentioned in the present invention.**

In addition, the polyester based coating composition of *Lee* has to adjust the compatibility of both hydroxyl unsaturated polyester resin and polyalkyl silicate in order to obtain excellent properties of a film of paint such as appearance and workability even without the addition of any defoaming agent and leveling agent, polyalkyl silicate is not used in the present invention.

In addition, in connection with the **baking temperature** of upper coating material used in both inventions, the temperature used in *Lee* is 250 to 280°C; that used in the present invention is 190 to 240°C.

In conclusion, it is apparent that the upper coating material of the present invention cannot be anticipated from *Lee* by one of ordinary skill in the art.

The Examiner pointed out that one of ordinary skill in the art would use *Lee*'s polyester coating composition on a zinc coated steel plate by *Choi*, and thus the present invention is unpatentable over the combination of prior references *Choi* and *Lee*.

However, as described above, in connection with the primer coating material used in both inventions, the primer coating material used in *Choi* is flexible polyester resin+ melamine resin + sulfonic acid + isocyanate + Ti based catalyst + pigment + deforming agent + leveling agent + UV filler + hydrocarbon based solvent + ester based solvent; that used in the present invention is colored or colored transparent epoxy-modified or polyester-modified primer.

Furthermore, in connection with the thickness of primer coating material used in both inventions, thickness coated by *Choi* is 10 to 20 μm ; that coated by in the present invention is 4 to 7 μm .

Furthermore, the upper coating material of the present invention cannot be anticipated from *Lee* by one of ordinary skill in the art, and thus the combination of prior references 1 and 2 cannot arrive at the present invention.


As discussed above, the present invention is greatly distinguished from *Choi* and *Lee* in that the components thereof are specifically restricted. Also, a person of ordinary skill in the art cannot arrive at the present invention from possible combinations between *Choi* and *Lee*. Accordingly, Applicants respectfully request withdrawal of the rejections and that a timely Notice of Allowance be issued in this case.

The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 05-0150

If the Examiner has any questions, she is invited to contact the undersigned below via telephone at +1.650.843.3375.

Respectfully submitted,
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